

Application No.: 10/772,510
Filed: February 5, 2004
Amendment dated: January 30, 2008
Reply to Office Action of October 30, 2007

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Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in this application:

Listing of Claims

Claims 1-2 (canceled)

Claim 3 (previously presented): The method as defined in claim 27 wherein the logical SAW segments are of identical size.

Claim 4 (previously presented): The method as defined in claim 27, wherein the logical SAW segments and the image field segments are each indexed, and are allocated to the image field segments a combination of SAW segment index and image field segment index, on the basis of which a determination is made of the image field segments to be compared, those image field segments which have an identical combination of SAW segment index and image field segment index being compared with one another.

Claim 5 (previously presented): The method as defined in claim 27, wherein a comparison of physically adjacent image field segments is performed.

Claim 6 (previously presented): The method as defined in claim 27, wherein offsets of the SAW are learned during initializing and are taken into account in determining the allocation.

Claim 7 (previously presented): The method as defined in claim 27, wherein at least one region that is invalid and that is blanked out upon comparison of the image field segments can be defined within the SAW and the imaged SAW segment, in which context a validity can depend on the position of the SAW on the wafer.

Claim 8 (previously presented): The method as defined in claim 27, wherein a line camera is used, to acquire microscopic images

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Claim 9 (previously presented): The method as defined in claim 27, wherein a line camera is used, which can acquire microscopic images, and the wafer is illuminated with a continuous light source.

Claim 10 (previously presented): The method as defined in claim 27, wherein an area camera is used, which can acquire microscopic images.

Claim 11 (previously presented): The method as defined in claim 27, wherein a relative motion of the wafer with respect to the camera occurs.

Claim 12 (previously presented): The method as defined in claim 11, wherein an image is acquired by way of a flash that is triggered, with a diaphragm open, as a function of the relative position of the wafer.

Claim 13 (previously presented): An apparatus for an analysis of surface images of at least one wafer, wherein the at least one wafer has features that are generated using a "stepper area window" (SAW), the apparatus comprising:

- a camera to acquire a plurality of images of the at least one wafer, wherein the camera defines an image field;

- a memory region in which the plurality of images of the wafer, acquired with the camera, are storable;

- means for initializing in a learning phase in which the image field of the camera is divided into SAW-segment-imaging image field segments in such a way that after a definable interval of acquired images, a repetition of an identical allocation of imaged SAW segments in image field segments occurs; and

- a processing unit for carrying out comparison operations in such a way that in the image field segments of images that have an identical allocation of image field segments to imaged SAW segments are compared with one another and/or with a specific model.

Claim 14 (previously presented): The apparatus as defined in claim 13, wherein the memory region is managed, by means of an array and a hash function, in such a way that the imaged SAW segments and the image field segments are each indexed, and are

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allocated to the image field segments a combination of SAW segment index and image field segment index, on the basis of which a determination is made of the image field segments to be compared, those image field segments which have an identical combination of SAW segment index and image field segment index being compared with one another.

Claim 15 (previously presented): The apparatus as defined in claim 13, wherein the processing unit compares only physically adjacent image field segments with one another on basis of a metric.

Claim 16 (previously presented): The apparatus as defined in claim 13, wherein the means for initializing in the learning phase are configured to learn offsets of the SAW in the initialization phase and to account for upon determination of the allocation.

Claims 17-26 (canceled)

Claim 27 (currently amended): A method for analyzing a patterned semiconductor wafer, wherein a specific number of dice are exposed with one "stepper area window" (SAW) using an identical mask to expose the patterned semiconductor wafer with a plurality of SAWs, comprising the steps of:

dividing the SAW ~~[[in]]~~ into a plurality of logical SAW segments,

initializing in a learning phase an image field of a camera, wherein the image field of the camera is divided by way of an interactive control system into a plurality SAW image field segments in such a way that after a definable interval of acquired image fields a repetition of an identical allocation of imaged SAW image field segments occurs:

allocating the logical SAW segments to image field segments, in such a way that as the camera travels over the wafer an identical allocation of logical SAW segments to image field segments occurs at a definable travel interval and image interval:

moving the camera with the image ~~field~~ field relative to the wafer and thereby acquiring a plurality of images wherein the plurality of images cover the entire wafer:

digitally storing the acquired images; and

carrying out comparison operations in run phases, in which the image field

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segments of images that have an identical allocation of image field segments to imaged SAW segments are compared with one another and with a specific master.

Claim 28 (currently amended): A method for analyzing a patterned semiconductor wafer, wherein a specific number of dice are exposed with one "stepper area window" (SAW) using an identical mask to expose the patterned semiconductor wafer with a plurality of SAWs, comprising the steps of:

- dividing the SAW in a plurality of logical SAW segments,

- initializing in a learning phase an image field of a camera, wherein the image field of the camera is divided by way of an interactive control system into a plurality SAW image field segments in such a way that after a definable interval of acquired image fields a repetition of an identical allocation of imaged SAW image field segments occurs:

- allocating the logical SAW segments to image field segments, in such a way that as the camera travels over the wafer an identical allocation of logical SAW segments to image field segments occurs at a definable travel interval or image interval:

- moving the camera with the image field relative to the wafer and thereby acquiring a plurality of images wherein individual image fields cover the entire wafer;

- digitally storing the acquired images; and

- carrying out comparison operations in run phases, in which the image field segments of images that have an identical allocation of image field segments to imaged SAW segments are compared with one another with a specific master.

Claim 29 (previously presented): The method as defined in claim 27, wherein an area camera is used, to acquire a microscopic or macroscopic images.

Claim 30 (previously presented): The method as defined in claim 27, wherein a line camera is used, which can acquire macroscopic images, and the wafer is illuminated with a continuous light source.

Claim 31 (currently amended): The apparatus as defined in claim 13, wherein the memory region is managed, by means of a hash function, in such a way that the logical SAW segments and the image field segments are each indexed, and are allocated to the

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image field segments a combination of SAW segment index and image field segment index, on the basis of which a determination is made of the image field segments to be compared, those image field segments which have an identical combination of SAW segment index and image field segment index preferably being compared with one another.

Claim 32 (currently amended): The method as defined in claim 27, wherein a line camera is used, to acquire [[a]] macroscopic images.

Claim 33 (previously presented): The method as defined in claim 27, wherein an area camera is used, which can acquire macroscopic images.

Claim 34 (previously presented): The method as defined in claim 27, wherein a relative continuous motion of the wafer with respect to the camera occurs.